

## Mass walls of insulated masonry units

*Statewide Alternate Methods are approved by the division administrator in consultation with the appropriate advisory board. The advisory board's review includes technical and scientific facts of the proposed alternate method. In addition:*

- *Building officials shall approve the use of any material, design or method of construction addressed in a statewide alternate method;*
- *The decision to use a statewide alternate method is at the discretion of the applicant; and*
- *Statewide alternate methods do not limit the authority of the building official to consider other proposed alternate methods encompassing the same subject matter.*

**Code/edition/section:** 2021 Oregon Energy Efficiency Specialty Code (OEESC) / ASHRAE 90.1-2019

**Date:** Aug. 16, 2021

**Subject:** Alternate thermal compliance path for mass walls found in Statewide Alternate Method 19-01 and the 2018 Washington State Energy Code.

### Background:

With the adoption of ASHRAE Standard 90.1-2019 as the 2021 OEESC, Statewide Alternate Method (SAM) 19-01 is discontinued effective Oct. 1, 2021. SAM 19-01 was tied solely to the use of the 2018 International Energy Conservation Code (IECC) for energy compliance and allowed continued use of a longstanding Oregon amendment for mass wall allowances. The language was approved by the governing advisory boards during the 2019 code adoption process as a code amendment proposal to the 2018 IECC. The allowance was an exception for code-compliant use of partially-insulated concrete masonry units (CMU) under specific circumstances.

During the March 17, 2021, rulemaking hearing for the adoption of the 2021 OEESC, four commenters noted the loss of the language that resulted from the adoption of the 2021 OEESC and the use of ASHRAE Standard 90.1. Three commenters requested the consideration of a new alternate method capturing the SAM 19-01 mass wall exception. Commenters noted several factors, including state- and regional-specific methods. The identical language is found in the 2018 and 2021 Washington State Energy Code (WSEC), and similar mass wall allowances are found in the California Energy Code for climate zones equivalent to the zones specified by the OEESC.

### Discussion:

Mass walls have inherent thermal advantage over low mass walls. Due to the high diurnal (between daytime and nighttime) temperature fluctuations in Oregon's climate zones, mass walls smooth the impacts of exterior heating/cooling loads over greater periods. Both California and Washington, states with similar climate zones, have investigated mass walls and, while exceeding national model code, have adopted amendments to the model codes specifically for mass walls.

The 2021 Washington State Energy Code adopted the same language as Oregon's prior codes. Washington's energy technical advisory group reviewed multiple changes to model code, with an in-depth review of the energy considerations for climate zones common to Oregon. The State of California's energy council has modified their thermal requirements for mass walls as well. The Title 24 California energy code sets a maximum U-factor limit below model code when applied to equivalent climate zones of Oregon.

The Oregon energy provisions are currently out of alignment with energy codes in the neighboring states of California and Washington for this specific construction methodology. In addition to the energy considerations, the structures noted in the proposed alternate method require high durability, may align with resiliency goals, and are of a lower energy use category.

**Conclusion:**

The proposed statewide alternate method repeats the mass wall footnote from prior Oregon code and the current Washington code. The alternate method considers unique climactic conditions within Oregon, and has a limited impact on energy conservation, as born-out by Washington and California processes.

The following amendments to the 2021 OEEESC and ASHRAE Standard 90.1-2019 are made part of this statewide alternate method ruling:

Blue/underline – added language to the ASHRAE Standard 90.1-2019

**Table 5.5-4 Building Envelope Requirements for Climate Zone 4 (A, B,C)**

| <i>Opaque Elements</i>    | <i>Assembly Maximum</i> |
|---------------------------|-------------------------|
| <i>Walls, above Grade</i> |                         |
| Mass                      | U-0.104 <sup>b</sup>    |

b. Exception: Integral insulated concrete block walls complying with ASTM C90 with all cores filled shall be considered compliant, when meeting both of the following:

- 1) at least 50% of cores shall be filled with vermiculite or equivalent fill insulation, and
- 2) the wall encloses the following building types: gymnasium, auditorium, church chapel, arena, kennel, manufacturing plant, indoor swimming pool, pump station, water and wastewater treatment station, storage facility, restroom and concessions, mechanical and electrical structures, storage areas, warehouse (storage and retail), and motor vehicle facility.

**Table 5.5-5 Building Envelope Requirements for Climate Zone 5 (A, B,C)**

| <i>Opaque Elements</i>    | <i>Assembly Maximum</i> |
|---------------------------|-------------------------|
| <i>Walls, above Grade</i> |                         |
| Mass                      | U-0.090 <sup>c</sup>    |

c. Exception: Integral insulated concrete block walls complying with ASTM C90 with all cores filled shall be considered compliant, when meeting both of the following:

- 1) at least 50% of cores shall be filled with vermiculite or equivalent fill insulation, and
- 2) the wall encloses the following building types: gymnasium, auditorium, church chapel, arena, kennel, manufacturing plant, indoor swimming pool, pump station, water and wastewater treatment station, storage facility, restroom and concessions, mechanical and electrical structures, storage areas, warehouse (storage and retail), and motor vehicle facility.

The technical and scientific facts for the statewide alternate method are approved.

*Signature on file*

**Alana Cox, Administrator  
Building Codes Division**

**Aug. 12, 2021**

**Date**